Case Study
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Carbon Burn-Out for Fly Ash Beneficiation

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Combustion of coal for production of electricity (among other uses) results in a tremendous amount of material such as fly ash as combustion products to be managed. One of the highest values and largest volume applications for the beneficial use of fly ash is in the replacement of Portland cement in concrete. This application not only promotes the recycling, rather than disposal, of a large volume of fly ash, it also results in a reduction in global Greenhouse Gas Emissions, saving CO_2 releases from the production of Portland cement of the order of 8/10ths of one ton of CO_2 saved for every ton of fly ash used.

This application is becoming increasingly difficult, however – ironically due to increasingly stringent air emissions (NO_x) requirements. Low NO_x burners, for example, typically reduce the efficiency of combustion to the extent that unburned carbon remaining with the fly ash renders that ash unmarketable for concrete applications. Similarly, SCR/SNCR controls for NO_x reduction, or ammonia injection to enhance electrostatic precipitator performance, wind up contaminating the ash with ammonia, which also restricts fly ash use.

Carbon Burn-Out (CBO™) technology has solved this dilemma for two Region 4 power plants. This process combusts fly ash with high carbon, using that carbon as its fuel, and producing a premium quality fly ash that can readily be sold to concrete "ready-mix" facilities. In addition, heat from the process is recovered and returned to the host power plant, making that plant more efficient and resulting in less coal consumption (therefore lower emissions) for it. As a direct result, approximately 400,000 tons of fly ash are recycled per year from these facilities instead of placed in landfills, and approximately 320,000 tons per year saved in CO2 emissions.

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COAL COMBUSTION PRODUCTS PARTNERSHIP

This coal ash utilization case study is a selection of the Coal Combustion Product Partnership. For more information, consult the C2P2 web site at http://www.epa.gov/epaoswer/osw/conserve/c2p2/